

CLAIMS

Sub
all.

1. A method for programming wireless subscriber terminals in a wireless system, the
2 wireless system having a base station in wireless communication with the wireless
3 subscriber terminals using one or more control channels and multiple traffic channels,
4 and each wireless subscriber terminal having a memory, a non-volatile memory, a
5 processor, and an original control program running on the processor to control operation
6 of the wireless subscriber terminal, the method comprising the steps of:

7 A. initializing one or more participating wireless subscriber terminals from
8 the base station, using a control channel, to receive a complete program over a
9 selected control channel;

10 B. transmitting a complete program from the base station using the selected
11 control channel, the complete program comprising a plurality of program
12 segments communicated to the wireless subscriber terminals in separate
13 messages;

14 C. verifying that each participating wireless subscriber terminal has received
15 the complete program;

16 D. storing the complete program in the non-volatile memory of each
17 participating wireless subscriber terminal as a new control program; and

18 E. transferring control of each participating wireless subscriber terminal to
19 the new control program.

2. The method of claim 1, wherein the step of verifying further comprises the steps
2 of:

3 A. polling each participating wireless subscriber terminal, using one or more
4 control channels, to determine whether any participating wireless subscriber
5 terminals have not received any program segments; and

6 B. retransmitting from the base station the program segments that any
7 participating wireless subscriber terminals have not received.

RP

1 3. The method of claim 2, wherein the unreceived program segments are
2 retransmitted over one or more point-to-point control channels.

1 4. The method of claim 2, wherein the unreceived program segments are
2 retransmitted over one or more broadcast control channels.

1 5. The method of claim 2, wherein the unreceived program segments are
2 retransmitted over one or more traffic channels.

1 6. The method of claim 1, wherein the step of verifying further comprises the step of
2 performing a series of diagnostic tests at each participating wireless subscriber terminal to
3 determine the validity of the new control program received at that wireless subscriber
4 terminal.

1 7. The method of claim 1, further comprising the step of storing each program
2 segment received by the wireless subscriber terminal in the non-volatile memory of the
3 wireless subscriber terminal, whereby the wireless subscriber terminal retains all received
4 program segments if reception of program segments by the wireless subscriber terminal is
5 interrupted.

1 8. The method of claim 1 further comprising the step of storing the original control
2 program in non-volatile memory after transferring control of the processor to the new
3 control program.

1 9. The method of claim 1 wherein the control program and the new control program
2 each comprise a software patch for controlling less than all of the operations of the
3 wireless subscriber terminal.

1 10. The method of claim 1 wherein the wireless subscriber terminal is a cellular
2 phone.

1 11. The method of claim 1 wherein the wireless subscriber terminal is a terminal of a
2 wireless local loop.

1 12. The method of claim 1 wherein the step of transferring control to the new control
2 program is forced by the base station during the step of initializing each wireless
3 subscriber terminal.

1 13. A system for programming wireless subscriber terminals, the system comprising:
2 a base station, the base station having a memory;
3 a control program stored in the memory of the base station;
4 one or more wireless subscriber terminals in wireless communication with the
5 base station over an air interface, the air interface comprising a plurality of traffic
6 channels and a plurality of control channels;
7 means for initializing the one or more wireless subscriber terminals, using the
8 control channels, to receive the control program;
9 means for broadcasting the control program to the one or more wireless subscriber
10 terminals;
11 means for verifying that each initialized wireless subscriber terminal has received
12 the control program; and
13 means for transferring control of each initialized wireless subscriber terminal to
14 the control program.

1 14. The system of claim 13, wherein the one or more wireless subscriber terminals
2 comprise cellular phone handsets.

1 15. The system of claim 13, wherein the one or more wireless subscriber terminals
2 comprise wireless local loop terminals.

RP

1 16. A base station for programming one or more wireless subscriber terminals in a
2 wireless system, the base station comprising:
3 a memory;
4 a control program stored in the memory as one or more program segments;
5 a transmitter for transmitting forward messages to wireless subscriber terminals
6 over an air interface, the forward messages including the one or more program segments
7 stored in the memory;
8 a receiver for receiving reverse messages from wireless subscriber terminals over
9 the air interface; and
10 a processor connected to the memory, the transmitter, and the receiver for
11 controlling operation of the base station.

1 17. The base station of claim 16, the forward messages including broadcast firmware
2 start messages and the reverse messages including broadcast firmware start response
3 messages.

1 18. The base station of claim 16, the forward messages including broadcast firmware
2 status request messages and the reverse messages including broadcast firmware status
3 messages.

1 19. The base station of claim 16, the forward messages including firmware switch-
2 over messages.

1 20. A method for operating a base station to program one or more wireless subscriber
2 terminals in a wireless system, the method comprising the steps of:

3 A. initializing a plurality of wireless subscriber terminals, using a control
4 channel, to receive a control program;

5 B. broadcasting the control program to the plurality of wireless subscriber
6 terminals;

RP

7 C. verifying that each one of the plurality of wireless subscriber terminals has
8 received the control program; and

9 D. transferring control of each one of the plurality of wireless subscriber
10 terminals to the control program.

1 21. The method of claim 20, the step of initializing further comprising the steps of
2 transmitting a broadcast firmware start message to each wireless subscriber terminal over
3 one or more forward channels and receiving a broadcast firmware start response message
4 from one or more participating wireless subscriber terminals over one or more reverse
5 channels.

1 22. The method of claim 20, the step of broadcasting further comprising the step of
2 transmitting one or more broadcast firmware block messages over a broadcast channel.

1 23. The method of claim 20, the step of verifying further comprising the steps of:
2 A. transmitting a broadcast firmware status request message to one or more
3 participating wireless subscriber terminal over one or more forward channels;
4 B. receiving a broadcast firmware status message from one or more of the
5 one or more participating wireless subscriber terminals;
6 C. retransmitting any missing program segments to the one or more
7 participating wireless subscriber terminals.

1 24. A wireless subscriber terminal for use in a wireless system, the terminal
2 comprising:
3 a memory;
4 a transmitter for transmitting reverse messages from the terminal over an air
5 interface, ;
6 a receiver for receiving forward messages from a base station, the forward
7 messages including the one or more program segments; and

RP

8 a processor connected to the memory, the transmitter, and the receiver for
9 controlling the terminal, and for storing the one or more program segments in the
10 memory.

1 25. The terminal of claim 24 wherein the forward messages include broadcast
2 firmware start messages and the reverse messages include broadcast firmware start
3 response messages.

1 26. The terminal of claim 24 wherein the forward messages include broadcast
2 firmware status request messages and the reverse messages include broadcast firmware
3 status messages.

1 27. The terminal of claim 24 wherein the forward messages include firmware switch-
2 over messages.

1 28. The terminal of claim 24 wherein the forward messages including the one or more
2 program segments are broadcast messages.

1 29. A method for operating a wireless subscriber terminal in a wireless system to
2 receive a control program, the method comprising the steps of:

- 3 A. initializing a terminal, using a control channel, to receive a control
4 program, the control program comprising a plurality of control program segments;
5 B. receiving a broadcast comprising the plurality of control program
6 segments;
7 C. verifying that the terminal has received all of the control program
8 segments; and
9 D. transferring control of the terminal to the control program.

KP

1 30. The method of claim 29, the step of initializing further comprising the steps of
2 receiving a broadcast firmware start message over a forward channels and transmitting a
3 broadcast firmware start response message over a reverse channel.

1 31. The method of claim 29, the step of receiving a broadcasting further comprising
2 the step of receiving a plurality of firmware block messages over a broadcast channel.

1 32. The method of claim 29, the step of verifying further comprising the steps of:

2 A. receiving a broadcast firmware status request message over a forward
3 channels;

4 B. transmitting a broadcast firmware status message over a reverse channel,
5 the broadcast firmware status message identifying any missing control program
6 segments;

7 C. receiving any missing control program segments identified in the
8 broadcast firmware status message.

1 33. The method of claim 29, the step of transferring control further comprising the
2 step of receiving a firmware switch-over message.

KP